

REMARKS

Claims 1-3, and 6 are pending. By this Amendment, claims 1 and 6 have been amended.

Claim 1 is amended to incorporate the subject matter of claims 4 and 5. Claims 1 and 6 have also been amended to recite that the track width of the end portion of the upper magnetic core is 1.5 μm or less.

Attached hereto is a Proposed Drawing Addition adding new Figure 8. New Figure 8 is supported by the original specification at page 20, line 13 to page 22, line 10, for example.

The Office Action objects to the drawings under 37 CFR 1.83(a) specifically indicating that the drawings must show the negative resist or an electron beam resist. It is respectfully submitted that such is shown in new Figure 8. Withdrawal of the objection is requested.

The Office Action objects to claims 4-7 regarding informalities in claims 4 and 6. The claims have been amended as required by the Examiner.

The Office Action rejects claims 1, 2, 4 and 6 under 35 U.S.C. 103 over Shouji (USP 6,033,580) in view of Toyoda (JP 06020227 A). Claim 3 is rejected under 35 U.S.C. 103 over Shouji in view of Toyoda and further in view of Hira (USP 5,567,333). Claims 5 and 7 are rejected under 35 U.S.C. 103 over Shouji in view of Toyoda and further in view of Ohashi (USP 5,828,533). These rejections are respectfully traversed.

Independent claim 1 recites that a distance between the first face and the second face is 0.2 to 1.5 μm . This feature is achievable by using the negative resist or electron beam resist. That is, the third plated magnetic layer is formed by using the negative resist or the electron beam resist. Attached hereto is a Declaration Under 37 C.F.R. 1.132 which was filed in the parent application, Serial No. 09/354,467, which Applicants resubmit in this application, and assert that it is equally applicable to this application. In particular, this Declaration shows how the claimed distance range of 0.2 to 1.5 μm is critical to achieving the desired results of a high magnetic field intensity centered about the gap layer. This relationship is shown in Sketch 1 attached to the Declaration. Sketches 2A and 2B show the contour line of magnetic field at a tip of the magnetic core. Sketch 2A is in the case of $Y = 0 \mu\text{m}$ and Sketch 2B is in the case of $Y = 0.2 \mu\text{m}$ where

"Y" is a distance between the first face of the second plated magnetic layer and the second face of the third plated magnetic layer. Each Sketch shows the relationship between distances between the first face and the second face on the upper part. The abscissa is the air bearing surface (ABS) and the ordinate distance from the center of the gap layer is shown in Sketch 2.

From these Sketches, the following can be understood. The magnetic field intensity above the surface drops abruptly at beyond $1.5\text{ }\mu\text{m}$ of the distance between the first face of the second plated magnetic layer and the second face of the third plated magnetic layer, as shown in Sketch 1. The magnetic field for recording is not concentrated on the magnetic gap at lower than $0.2\text{ }\mu\text{m}$ of the distance between the first face of the second plated magnetic layer and the second face of the third plated magnetic layer, as shown in Sketch 2. In the case of Sketch 2A, there is a region of densely contoured line. This region is designated by a symbol A. This means that there is a region in which the magnetic field is concentrated at another part except for the magnetic gap. The second concentrated region causes leakage in magnetic fields for recording, which is in danger of recording on the other portion of the recording medium, except the portion corresponding to the magnetic gap.

On the other hand, in case of Sketch 2B, it has not been found out that there is the above-mentioned second concentrated region A except occurring at the magnetic gap. The magnetic field is concentrated on only the portion of the magnetic gap. This case has no danger of recording on the other part of the recording medium except for the magnetic gap.

From these findings discovered by the inventors of the present application, it is understood that it is necessary to keep the distance of not less than $0.2\text{ }\mu\text{m}$ between the first face and the second face for being concentrated on the portion of the magnetic gap and that the distances between the first face and the second face of $1.5\text{ }\mu\text{m}$ is an upper limit for keeping the magnetic field intensity at a high level on an air bearing surface. Thus, the range of $0.2\text{ }\mu\text{m}$ to $1.5\text{ }\mu\text{m}$ for the distances between the first face and second face have been discovered by the inventors and claimed in this application. This range is not easily obtained and is not obvious from the cited reference. This range is new and novel and the cited reference does not render it obvious.


Further, claims 1 and 6 both recite the track width of the end portion of the upper magnetic core is 1.5 μm or less. This is not disclosed in the cited reference and accordingly the claims would not have been obvious. Withdrawal of the rejection is requested.

For at least the above reasons, it is submitted that the application is in condition for allowance. Prompt consideration and allowance are solicited.

The Office is authorized to charge any fees due under 37 C.F.R. §1.16 or 1.17 to Deposit Account No. 11-0600.

Should there be any questions, the Examiner is invited to contact Applicants' undersigned attorney.

Respectfully submitted,


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